MATHS TREATS BY LUCIANA THE POSSUM

NORM DO

Norm Do did puzzles with his mum from a young age and learned to 'read between the lines'. He enjoyed primary school mathematics because it was playful, and the teacher encouraged him to explore. Norm didn't find the secondary school mathematics curriculum interesting but enjoyed enrichment and mathematics Olympiad activities. He planned to study arts and science at university but was talked out of it by his friend's mum and ended up gaining bachelor's degrees in science and engineering. Norm didn't enjoy the vocational side of engineering but enjoyed the mathematics and physics in his science degree which subsequently led to science honours and a PhD in pure mathematics. At school, he loved combinatorics, discrete mathematics and problem solving, but he did not particularly like calculus. Now Norm is very interested in geometry, topology and mathematical physics. He regrets not studying more statistics as it broadens what mathematics is about.

SHAPES AND NETWORKS
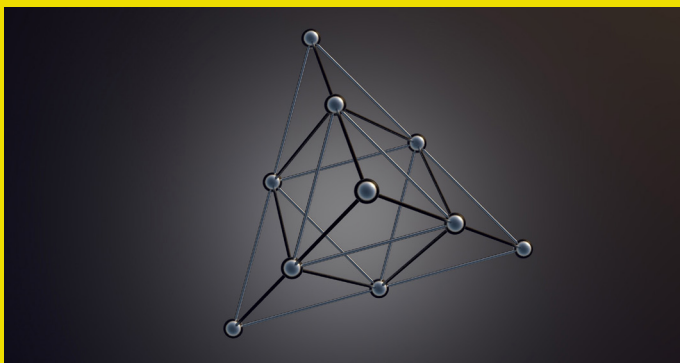
Network topology is important for communications and involves the arrangement of elements such as vertices or nodes, and edges or links. Two dimensional shapes can be laid out to form a more complicated flat shape or a three dimensional geometric solid. Can you identify the nodes and the links in the shape above? Can you find a fake hexagon? Why is it fake? How many different 'solid' shapes can you find?

ACTIVITY

Think about how shapes can relate to a network. For example, a tetrahedron is made up of four triangles. What happens with five triangles? With twenty triangles? What about 2019 triangles? What networks can be formed with other shapes such as squares or pentagons? What happens if you mix shapes?
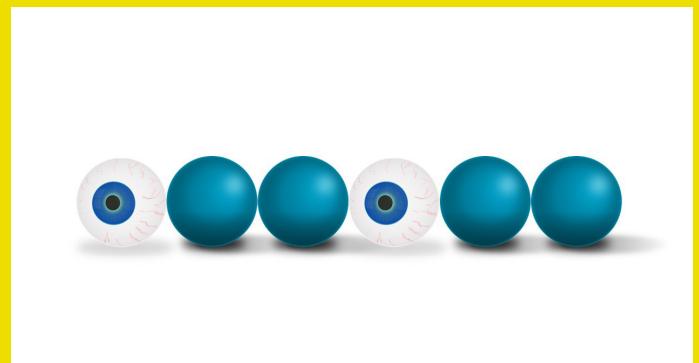
COMBINATORICS

Combinatorics is about counting the way that things can be structured or arranged. Applications include coding and loops, and probability.

ACTIVITY

If you have six different items, how many ways can you place them on a table? Do you get different answers if you place them in a row, a circle, a rectangle or a pile? How else could you place them? What about if you have a larger number of items? How many ways can you sort 20 items if there are four kinds of each item (e.g., 20 balls = 5 red, 5 blue, 5 yellow, 5 white)? What happens if there are different quantities of each type of item?

REFERENCES AND FURTHER READING

ABOUT NORM

Norm's web page   http://users.monash.edu/~normd/

How, what, and why I think about maths   http://users.monash.edu/~normd/documents/Ivanhoe-Talk-2014.pdf

The Hitchhiker's Guide to Geometry   www.youtube.com/watch?v=sgsVce3UYzI

DISCRETE MATHEMATICS

https://en.wikipedia.org/wiki/Discrete_mathematics

https://en.wikipedia.org/wiki/Combinatorics

https://en.wikipedia.org/wiki/Topology

https://en.wikipedia.org/wiki/Network_topology

IMAGES

Leadbeater possum - Steve Kuiter, other images from Pixabay